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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/245,198	02/05/1999	JEFFREY BROWNING	A003	4642

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EXAMINER
SCHNIZER, RICHARD A

ART UNIT	PAPER NUMBER
1632	

DATE MAILED: 12/28/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application No. 09/245,198	Applicant(s) BROWNING ET AL.	
	Examiner Richard Schnizer	Art Unit 1632	

-- The MAILING DATE of this communication appears n the c ver sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10-25,27,28 and 30-35* is/are pending in the application.

4a) Of the above claim(s) *11-25,27 and 32-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10 and 28-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Request for Continued Examination

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/11/01 has been entered.

Claims 9, 11-27, 29, and 32-35 were canceled as requested. Claims 1-8, 10, 28, 30, and 31 remain pending and are under consideration in this Office Action.

A Declaration under 37 CFR 1.63 was received and entered as Paper No. 17 on 10/11/01. This Declaration overcomes the Examiner's objections to priority claims, raised in Paper No. 15.

The previously indicated allowability of claims 2 and 3 is withdrawn in view of the new grounds of rejection set forth below.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 4-8, and 10 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, for the reasons of record in Paper Nos. 11 and 15.

Claims 1, 6-8, and 10 embrace polynucleotides encoding polypeptides comprising SEQ ID NO:2 or 4. Thus these claims continue to embrace genomic clones of the human and mouse tumor necrosis factor related ligand (TRELL) genes, including introns and flanking sequences such as promoters and response elements. As noted in Paper Nos. 11 and 15, no structures of any genomic TRELL intron or flanking sequence has been disclosed. *Vas-Cath Inc. v. Mahurkar*, 19USPQ2d 1111, clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed* (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed" (See *Vas-Cath* at page 1116). A gene is a chemical compound, albeit a complex one, and it is well established in our law that conception of a chemical compound requires that the inventor be able to define it so as to distinguish it from other materials, and to describe how to obtain it. See Oka, 849 F.2d at 583, 7 USPQ2d at 1171. Conception does not occur unless one has a mental picture of the structure of the chemical, or is able to define it by its method of preparation, its physical or chemical properties, or whatever characteristics sufficiently distinguish it. It is not sufficient to define it solely by its principal

biological property, e.g., encoding human erythropoietin, because an alleged conception having no more specificity than that is simply a wish to know the identity of any material with that biological property. We hold that when an inventor is unable to envision the detailed constitution of a gene so as to distinguish it from other materials, conception has not been achieved until reduction to practice has occurred, i.e., until after the gene has been isolated. Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016, 1021 (Fed. Cir. 1991). Because the specification fails to reduce to practice, or otherwise disclose, the structure of the any genomic clone of a TRELL gene, one of skill in the art could not conclude that Applicant was in possession of the claimed genus at the time of filing.

Claim 4 is drawn to substantially purified DNA that hybridizes to a fragment of at least 20 consecutive bases SEQ ID NOS: 1 or 3, wherein the DNA encodes a polypeptide at least 50% homologous with the receptor binding domain of TRELL. Claim 5 is drawn to a substantially purified DNA that encodes the amino acid sequence of SEQ ID NO: 2 or 4, but which must encode alterations, deletions, or substitutions of these sequences.

As noted below under 35 USC 112, second paragraph rejections, the specification fail to define what is and is not the receptor binding domain of any TRELL polypeptide. In the absence of a description of the limits of the receptor binding domain, one of skill in the art could not calculate whether a given polypeptide was 50% identical to that domain. For this reason alone, one of skill in the art could not conclude that Applicant was in possession of the genus of claim 4 at the time of filing. However, claim 4 is not limited to nucleic acids encoding polypeptides with

at least 50% homology to the receptor binding sites encoded by SEQ ID NOS:1 or 3, but embraces TRELL sequences from any source. Applicant is referred to the Guidelines on Written Description published at FR 66(4) 1099-1111 (January 5, 2001) (also available at www.uspto.gov). The following passage is particularly relevant.

> The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant identifying characteristics, i.e. structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between structure and function structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus.
> A "representative number of species" means that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within a genus, one must describe a sufficient number of species to reflect the variation within the genus. What constitutes a "representative number" is an inverse function of the skill and knowledge in the art. Satisfactory disclosure of a "representative number" depends on whether one of skill in the art would recognize that applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus in view of the species disclosed. In an unpredictable art, adequate written description of a genus which embraces widely variant species cannot be achieved by disclosing only one species within the genus.

The claim requires sequence identity of 20 nucleotides, and 50% amino acid identity for the receptor binding domain, which domain is undisclosed. Because the specification fails to identify the length of the required 50% identical fragment, it is unclear what is the required degree of similarity between the members of the claimed genus. However, even if the human receptor binding domain had been defined as the entire 204 amino acid extracellular domain, this would require no more than about 36% overall amino acid identity with the disclosed human sequence (50% of 204, expressed as a percentage of the total protein length, 284 amino acids). Thus the variation in the claimed genus would be substantial even if the claims were limited to nucleic acids encoding receptor binding domains 50% homologous to human TRELL. However,

the claims are not limited by homology to human TRELL, but rather embrace the broader genus of nucleic acids encoding homology to any TRELL receptor binding domain. One of skill in the art appreciates that the sequence of a given polypeptide varies from organism to organism. For this reason the variation in the claimed genus is quite large, with less than 36% amino acid identity in the receptor binding domain. Furthermore, and pertinent also to claim 5, the specification fails to provide any guidance as to the relationship between the structure of the receptor binding domain and its function. In particular, there is no guidance as to how the domain can vary while still retaining its function *e.g.* no specific examples are given regarding specific substitutions that can be made while retaining any TRELL function. Because the variation in the claimed genuses is substantial, and because the function of polypeptides comprising amino acid sequence alterations is unpredictable, the disclosure of only two nucleic acid sequences does not constitute a written description that would allow one of skill in the art to immediately envision the specific structure for any non-disclosed polynucleotide, including those with homology to the receptor binding domain, or those with TRELL activity but which vary from SEQ ID NOS: 1 and 3 by insertions deletions or alterations. As discussed above, *Vas-Cath Inc. v. Mahurkar*, 19USPQ2d 1111, clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed* (See page 1117.) The specification does not "clearly allow persons of

ordinary skill in the art to recognize that [he or she] invented what is claimed" (See *Vas-Cath* at page 1116).

As there is no disclosure of the polynucleotides, the skilled artisan cannot envision the detailed chemical structure of the encompassed polynucleotides, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. The nucleic acid itself is required. See *Fiers v. Revel*, 25 USPQ2d 1601 at 1606 (CAFC 1993) and *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016.

The limited information provided in the specification is not deemed sufficient to reasonably convey to one skilled in the art that Applicants were in possession of the broadly claimed genuses of polynucleotides at the time the application was filed. Thus it is concluded that the written description provision of 35 U.S.C 112, first paragraph, is not satisfied for the claimed polynucleotides. Applicants are reminded that *Vas-Cath* makes clear that the written description provision of 35 U.S.C 112 is severable from its enablement provision (see page 1115).

Enablement

Claims 4, 5 and 28-31 stand rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for nucleic acid molecules encoding SEQ ID NOS:2 or 4, and

for methods of expressing SEQ ID NOS: 2 or 4 in mammalian cell *in vitro*, does not reasonably provide enablement for nucleic acid molecules encoding variants of SEQ ID NOS:2 or 4 which do not comprise exactly the same amino acid sequences as SEQ ID NOS:2 or 4, or for methods of expressing any polypeptide in a mammalian cell *in vivo*. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims, for the reasons of record in Paper Nos 11 and. 15.

Claims 4 and 5 are drawn to nucleic acids encoding variants of the polypeptides of SEQ ID NOS:2 and 4. SEQ ID NO:2 comprises the amino acid sequence of mouse TRELL, SEQ ID NO:4 comprises the amino acid sequence of human TRELL. Claim 4 requires that the nucleic acid must encode a polypeptide that is at least 50% homologous with the receptor binding domain of a TRELL. Claim 5 requires that alterations, substitutions, or deletions must be made to SEQ ID NOS: 2 or 4, but that these changes cannot abolish the biological activity of TRELL. Thus the claims embrace nucleic acids encoding polypeptides that may vary substantially from the disclosed amino acid sequences of SEQ ID NOS:2 and 4.

The specification teaches the polynucleotides of SEQ ID NOS 1 and 3, which encode amino acid sequences of SEQ ID NOS: 2 and 4. The specification also teaches the construction of a form of human TRELL lacking the transmembrane region of TRELL, and consisting of some fraction of the extracellular TRELL domain of TRELL linked to a secretion signal and a myc epitope tag. See pages 34 and 35. However, it is unclear if this polypeptide has any TRELL

biological activity. The specification discloses a functional test of TRELL activity at page 36, and results are given in Table II on page 37. The test on page 36 discloses that human TRELL was used in the assay. Thus it is unclear as to whether the modified human TRELL or the wild type human TRELL was used in the assay. Thus the specification teaches only two forms of TRELL which can be considered to be functional, SEQ ID NOS: 2 and 4.

Claim 4 specifically requires a nucleic acid encoding a polypeptide with 50% homology to a receptor binding domain of a TRELL. However, the specification fails to define the limits of any receptor binding domain of any TRELL, and it is not disclosed in the prior art of record. Thus one of skill in the art could not calculate whether or not a given polypeptide was 50% identical to a receptor binding domain of TRELL. In Genentech, Inc, v Novo Nordisk A/S, the court found that when the specification omits any specific starting material required to practice an invention, or the conditions under which a process can be carried out, there is a failure to meet the enablement requirement. See 42 USPQ2d 1001.

> It is true, as Genentech argues, that a specification need not disclose what is well known in the art. See, e.g., Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1385, 231 USPQ 81, 94 (Fed. Cir. 1986). However, that general, oft-repeated statement is merely a rule of supplementation, not a substitute for a basic enabling disclosure. It means that the omission of minor details does not cause a specification to fail to meet the enablement requirement. However, when there is no disclosure of any specific starting material or of any of the conditions under which a process can be carried out, undue experimentation is required; there is a failure to meet the enablement requirement that cannot be rectified by asserting that all the disclosure related to the process is within the skill of the art. It is the specification, not the knowledge of one skilled in the art, that must supply the novel aspects of an invention in order to constitute adequate enablement. This specification provides only a starting point, a direction for further research.

In this case, the identification of the precise limits of a TRELL receptor binding domain cannot be considered a minor detail which can be omitted in the process of providing an enabling disclosure, and one of skill in the art could not make the claimed nucleic acids, other than those encoding polypeptides comprising SEQ ID NOS:2 or 4, without undue experimentation.

Pertinent to the variant forms of TRELL encompassed by claims 4 and 5, the prior art also teaches that the effects of amino acid substitutions and deletions on protein function are highly unpredictable. Rudinger (In Peptide Hormones J.A. Parsons, Ed. University Park Press, Baltimore, 1976, page 6) teaches that "[t]he significance of particular amino acids and sequences for different aspects of biological activity cannot be predicted *a priori* but must be determined from case to case by painstaking experimental study." Furthermore Ngo et al (In The Protein Folding Problem and Tertiary Structure Prediction, K. Merz Jr. and S. Legrand, Eds. Birkhauser, Boston, 1994, see page 492) teaches that "[i]t is not known if there exists an efficient algorithm for predicting the structure of a given protein from its amino acid sequence alone. Decades of research have failed to produce such an algorithm". One might argue that it would not be undue experimentation to express and assay polypeptides individually, and thereby empirically determine the function of each one. However as set forth in *In Re Fisher*, 166 USPQ 18(CCPA 1970), compliance with 35 USC 112, first paragraph requires:

> that the scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art; in cases involving predictable factors, such as mechanical or electrical elements, a single embodiment provides broad enablement in the sense that, once imagined, other embodiments can be made without difficulty and **their performance characteristics predicted by resort to known scientific laws**; in cases involving unpredictable factors, such as most chemical reactions and physiological activity, scope of enablement varies inversely with the degree of unpredictability of the factors involved.

Emphasis added. Taken together, the teachings of the prior art indicate that substitutions, additions and deletions of SEQ ID NOS: 2 and 4 may produce inactive proteins, and that the functions of altered versions of SEQ ID NOS: 2 and 4 are highly unpredictable. Because the effects of alterations to SEQ ID NOS:2 and 4 are unpredictable, and because the specification fails to teach which specific alterations can be made without abolishing TRELL activity, one of skill in the art could not make the claimed nucleic acids, other than those encoding polypeptides comprising SEQ ID NOS:2 or 4, without undue experimentation.

Claims 28, 30 and 31 are drawn to methods of expressing TRELL in a mammalian cell. It is readily apparent that this invention may be used in vitro for the production of the TRELL protein and for its subsequent use in studying TNF receptor signal transduction. However, the specification also teaches that the nucleic acids of the invention may be used for gene therapy for inducing antitumor responses. See e.g. page 6, line 32 to page 7, line 1; page 8, lines 9 and 10; and page 13, lines 16-22.

The specification provides very limited guidance regarding methods of gene therapy, generally disclosing that the claimed DNA sequences can be used to express TRELL under abnormal conditions. The sequences could be expressed in tumor cells under the direction of promoters appropriate for such applications and such expression could enhance anti-tumor immune responses or directly affect the survival of the tumor. In addition, the sequences can be used to affect the survival of an organ graft by altering the local immune response (see page 13 of

the specification). However, the specification does not disclose abnormal conditions, other than cancer or organ graft, which can be treated by expressing a polynucleotide encoding TRELL. The specification also fails to disclose the types of tumors in a patient which could be treated by expressing a polynucleotide encoding TRELL, or any alterations in the local immune response as a function of the expression of a polynucleotide encoding TRELL. The specification does not disclose appropriate promoters to use, appropriate target sites for delivery of the polynucleotide, appropriate expression vectors required in the delivery of the polynucleotide, or the level of expression of the polynucleotide such that an anti-tumor response or an alteration in the local immune response is achieved. It is further noted that the specification discloses that only one cell line of eleven cell lines tested *in vitro* displayed any response to a TRELL peptide, and this response required the presence of interferon-gamma (see Table II on page 37 of the instant application). Clearly, the showing in the specification is not sufficient to solve the art-recognized problems associated with gene therapy, as set forth by Verma and Orkin (see Paper Nos. 11 and 15). Thus, as stated in the Paper Nos. 11 and 15, the specification is non-enabling for gene therapy protocols as the specification does not disclose methods by which the skilled artisan could predictably and reproducibly introduce and express TRELL polynucleotides in a mammal for therapeutic effect of any disease or disorder. This portion of the rejection may be overcome by limiting claims 28-31 to methods of expressing TRELL in a mammalian cell *in vitro*.

Response to Arguments

Applicant's arguments filed 10/11/01 have been fully considered but they are not persuasive.

With respect to claims 1, 6-8, and 10, Applicant argues at pages 8 and 9 of the response that inclusion of the word "isolated" would be understood by one of ordinary skill in the art to exclude genomic sequences in their natural state. In response the PTO notes that it would not exclude isolated genomic clones comprising promoter and intronic sequences. Because such sequences are embraced by the claims but are not described in any way in the specification, the written description requirement remains unmet.

Applicant argues at page 9 of the response that the inclusion of hybridization wash conditions in claim 4 is sufficient to overcome the rejection. This argument is not supported by reasoning, and it is unclear how the inclusion of hybridization conditions can substitute for a description of the structure or precise limits of the receptor binding domain. These limits must be known in order to determine which nucleic acids encode polypeptides with 50% homology to a TRELL receptor binding domain.

With respect to claim 5, Applicant argues at page 9 of the response that one of ordinary skill in the art would be able to make conservative alterations, substitutions, and deletions in SEQ ID NOS:2 and 4 while maintaining biological activity of TRELL, thus Applicants were in possession of the invention at the time of filing. This appears to be an argument that the claim is enabled, rather than described. Applicant is reminded that *Vas-Cath* makes clear that the written

description provision of 35 U.S.C 112 is severable from its enablement provision (see page 1115). The disclosure fails to provide a single example of any altered version of SEQ ID NOS: 2 or 4 which retains activity, or any guidance as to which residues can be altered without interfering with activity. With respect to enablement, Applicant's argument is unpersuasive because it lacks support. Applicant has provided no evidence or argument that the teachings of the specification add anything to the state of the art with regard to the predictability of the effects of amino acid alterations on polypeptide structure and function, particularly in view of the teachings of Rudinger and Ngo.

Applicant has not responded to the enablement rejection of claims 28, 30 and 31 over the expression of TRELL *in vivo*.

For these reasons the rejection is maintained.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2-5 are indefinite because it is unclear what is intended by the phrase "substantially purified". In this context, "substantially" is a relative term. The term

"substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. AS a result it is unclear what degree of purification is required by the claims.

Claim 4 is also indefinite because it recites "the receptor binding domain of TRELL" without antecedent basis. The specification teaches two non-identical versions of TRELL, SEQ ID NOS:2 and 4, so it is unclear to which version the claim refers. The claim is also indefinite in its recitation of "a polypeptide at least 50% homologous with the receptor binding domain of TRELL". The specification fails to delimit any receptor-binding domain of TRELL, noting only that this domain is located in the C-terminal portion of the polypeptide. In the absence of the precise limits of the receptor-binding domain, one of skill in the art cannot calculate whether a polypeptide is 50% homologous or not. Thus one of skill in the art cannot know the metes and bounds of the claim.

Claim 5 is also indefinite because it recites a non-sequitur. Claim 5 requires that a nucleic acid must encode either SEQ ID NO:2 or SEQ ID NO:4, but then requires that the nucleic acid must encode substitutions, alterations, or deletions. Thus the claim requires that a nucleic acids must encode SEQ ID NO:2 or 4, but then prohibits the nucleic acid from doing so.

Claim 5 is also indefinite because it recites "the biological activity of TRELL" without antecedent basis. Furthermore, it is not clear what is intended by "biological activity". The specification defines "biologically active" at page 10, lines 23-29 as "having an *in vivo* or *in vitro*

activity which may be performed directly or indirectly." Thus the specification suggests that TRELL may have more than one biological activity, and one of skill in the art has no way of knowing to which activity the claim refers.

Conclusion

No claim is allowed. All claims are free of the prior art of record.

Any inquiry concerning this communication or earlier communications from the examiner(s) should be directed to Richard Schnizer, whose telephone number is 703-306-5441. The examiner can normally be reached Monday through Friday between the hours of 6:20 AM and 3:50 PM. The examiner is off on alternate Fridays, but is sometimes in the office anyway.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Crouch, can be reached at 703-308-1126. The FAX numbers for art unit 1632 are 703-308-4242, and 703-305-3014.

Inquiries of a general nature or relating to the status of the application should be directed to the Patent Analyst Patsy Zimmerman whose telephone number is 703-308-8338.

Richard Schnizer, Ph.D.